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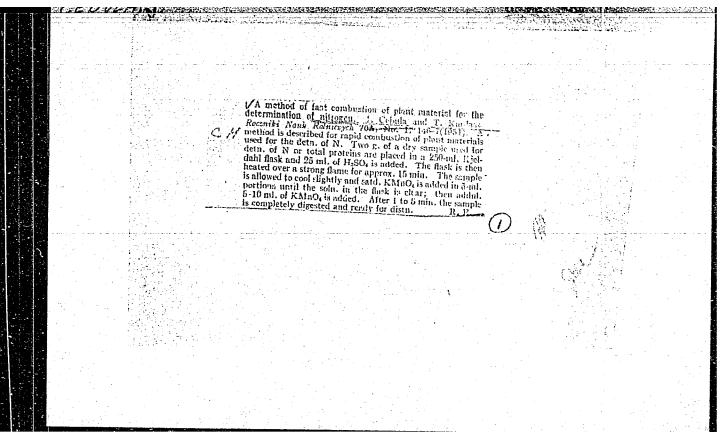
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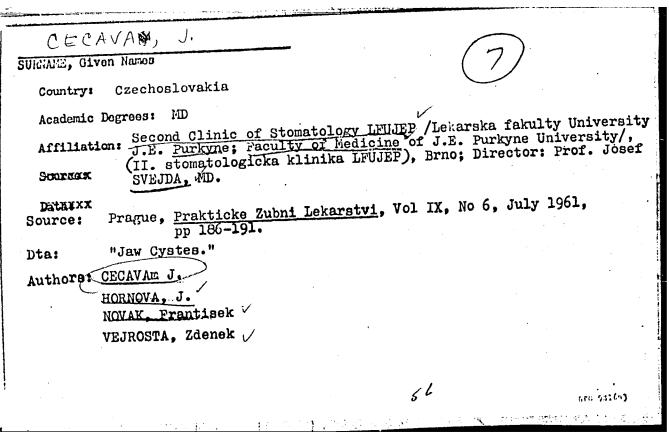
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"APPROVED FOR RELEASE: 06/09/2000 CI

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URNAME, Given Names

Country:Czechoslovakia

Academic Degrees:
Second Stomatology Clinic Medical Faculty Purkyne University /II stomatologeond Stomatology Clinic Medical Faculty Purkyne University /II stomatology /II stomato

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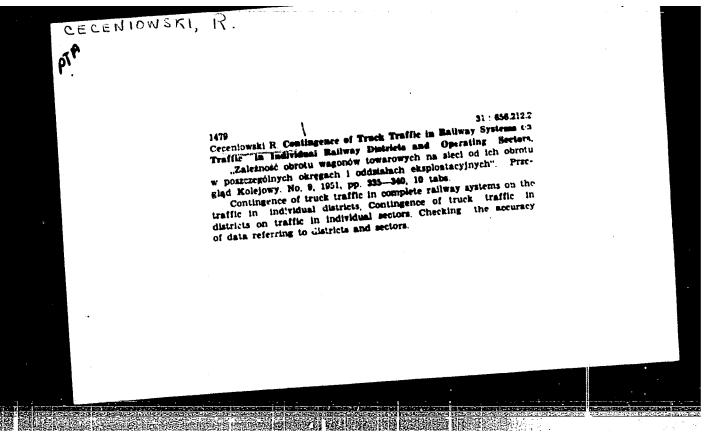
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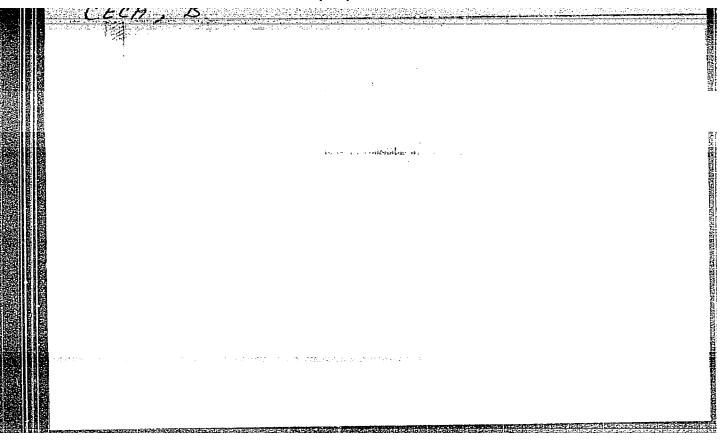
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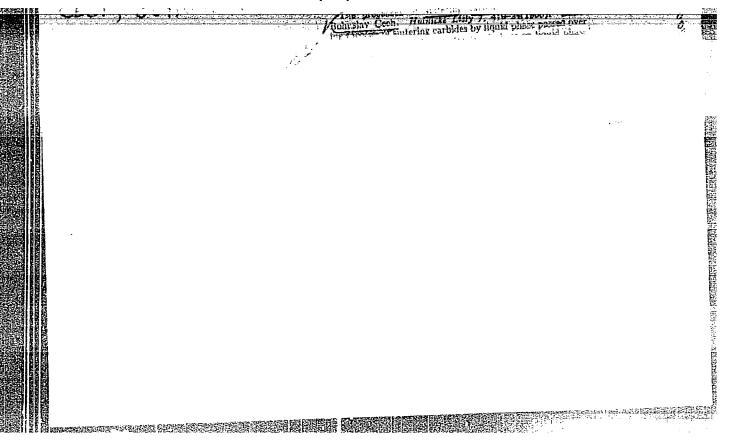
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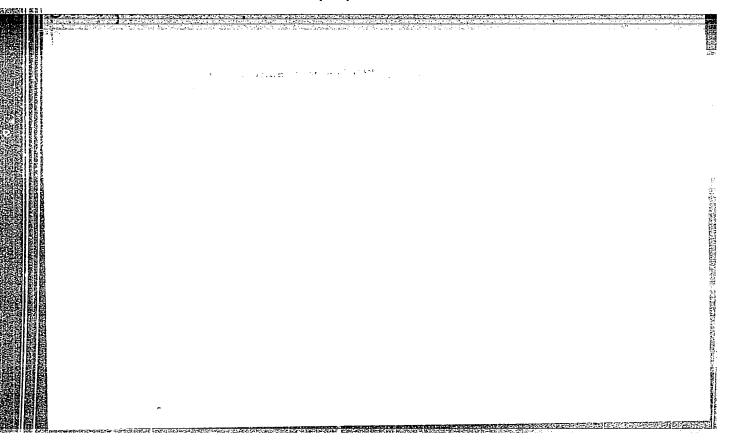
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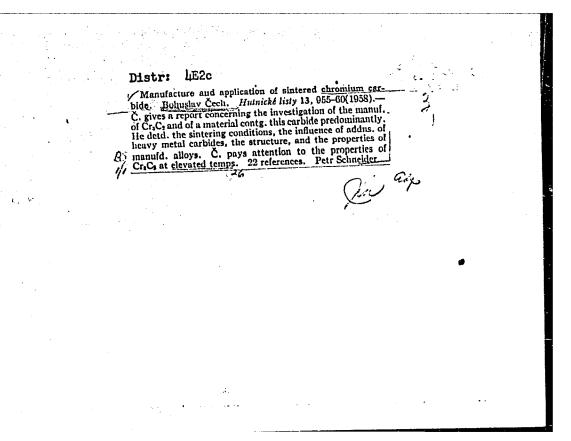
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Monthly list of East European Accessions (EEAI), LC, Vol. 8, No. 6, Jun 59, Unclas.

81103 Z/012/60/000/01/001/015 E073/E535

18.6100

Čech, Bohuslav, Engineer AUTHOR:

On the Problem of Structural Stability of Titanium TITLE:

Carbide Cermets()

PERIODICAL: Silikaty, 1960, No 1, pp 1-9 + 2 plates

ABSTRACT: The aim of the work described in this paper was to verify the stability of titanium carbides under sintering conditions, particularly in those cases in which high melting point metals are used as binders. For the purpose of comparison some sintering tests on carbides of high melting point metals with metallic titanium were also included in the test programme. If the titanium carbide does not fall apart during sintering, it can be assumed that it is also stable at the normal operating temperatures which are usually considerably lower than the sintering temperatures. In the first part data published in literature are reviewed. On the basis of data published by Kubaschevski and

Card 1/4 Evans (Ref 13) and Yumanskiy and Samsonov (Ref 14)

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On the Problem of Structural Stability of Titanium Carbide Cermets

the free enthalpy has been calculated for a number of compounds; in "ig 1 the dependence is graphed of the free enthalpy of the formation of carbides on the reaction temperature. Comparison of the published free enthalpy values under standard conditions shows that this value does not provide a uniform measure on the stability of carbides during sintering in vacuum. Data on the composition of the specimens used in the experiments and the sintering conditions (temperature, degree of vacuum) and on the achieved absolute and relative An experimental vacuum densities are given in Table 3. furnace was used, a sketch of which is shown in Fig 2. The specimens, were prepared from a mixture of the titanium carbide powder containing 19.1% combined carbon, 0.3% free graphite and the powder of the binding metal. The mixture was ground on a laboratory vibration mill

Card 2/4 in benzene for a duration of 24 hours, using a small

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On the Problem of Structural Stability of Titanium Carbide Cermets

> addition of paraffin so as to prevent oxidation of the powder in air. From the mixture, rods of 5 x 5 x 50 mm, 28 mm diameter cylinders and 30 \times 30 \times 5 mm plates were prepared which were all sintered in the experimental vacuum furnace. Furthermore, rods of 10 x 10 x 120 mm were sintered in an arrangement as shown in the sketch, Microstructure photographs of the obtained sintered specimens are shown in Figs 4a to 4i (plate). The results of metallographic and X-ray diffraction analysis can be compared from the data given in Table 5. Sintering of titanium carbides with chromium alloys or with elementary chromium resulted in the formation of chromium carbides. Experiments were also made with binary Ni-Al alloys, ternary Ni-Al-Mo alloys with a Mo-Ni alloys and with niobium; formation of carbides of these metals at the expense of decomposition of

Card 3/4 titanium carbides was not observed. The system TiC-Nb

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On the Problem of Structural Stability of Titanium Carbide Cermets

appears promising but this requires high sintering temperatures to achieve the desired density. In the systems NbC-Ti and VC-Ti decomposition of the NbC and VC carbides occurred and formation of titanium carbide, which is in accordance with anticipations. There are 3 figures, 5 tables and 15 references, 2 of which are Soviet, 5 German and 8 English.

ASSOCIATION: VUPM Vestec, Nr Prague

SUBMITTED: April 6, 1959

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E073/E535

Čech, Bohuslav, Engineer, Candidate of Technical Sciences

The Kinetics of Sintering of Cermets Under Conditions of AUTHOR: TITLE:

Liquid Phase Formation

PERIODICAL: Hutnické listy, 1960, Nr 4, pp 287-292

ABSTRACT: The kinetics of sintering, i.e. the degree of shrinkage function of sintering temperature, was investigated by means of a dilatometer, described by R. S. Mints (Ref 9). This apparatus enables carrying out tests up to 1400-1500°C if Al₂0₃ tubes are used; for high temperatures BeO tubes have to be used. A pressure of 100 g was applied to the contacts; the cross-section of the rod at the beginning of the experiment was 10 x 10 mm, i.e. the specific pressure was 1 g/mm². This apparatus enabled rapid heating to the sintering temperature and following the shrinkage of the specimen at that temperature. From the point of view of studying the kinetics of sintering a rapid heating to the sintering temperature is important. The results for a material G3 (WC + 15% CO sintered at 1250 and at 1350°C are Card 1/5 plotted in Fig 4. It can be seen that immediately after

Z/034/60/000/04/006/028 E073/E535

The Kinetics of Sintering of Cermets Under Conditions of Liquid Phase Formation

temperature equalization an intensive shrinkage takes place, which is very soon stopped, and then shrinkage continues at a value considerably lower than the value corresponding to full sintering. At 1350°C the process of shrinkage starts at the same temperature and after temperature equalization there is a rapid change in length until complete sintering is achieved. The kinetic curves for the systems ZrB2+10% Ni are plotted in Fig 5. Figs 6 and 7 show the sintering conditions for an alloy consisting of TiC + 50% (Ni-Co-Cr alloy, 60/20/20). In Table 1, changes in length and the changes in the specific weight are given for ${
m LT}_{\rm B}$ specimens, produced from titanium carbide which was ground in air for a duration of 100 hours, with a total content of 18.66% C of which 1.33% C was in the free state. A nonuniform shrinkage was also observed for the system of Cr_3C_2 + 15% Ni + 5% WC (Fig 8). Theoretical relations derived on the basis of the work published by Mackenzie and Shuttleworth (Ref 6) show close agreement with the experimental results for the system ZrB2-Ni.

Card 2/5

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The Kinetics of Sintering of Cermets Under Conditions of Liquid Phase Formation

However, the diagram of this system has so far not been thoroughly studied and no conclusions can be derived at its state during sintering. For the system WC-Co the theoretical diagrams differed particularly inasmuch that the speed of sintering reaches the maximum value at temperatures which are below those corresponding to the liquid phase in the inflection point of the curve; the relative density stabilizes at certain values without achieving the full degree of shrinkage. The system WC-Co is a simple pseudobinary system with an eutectic. This eutectic wets fully the solid WC grains in hydrogen and apparently also in vacuum. In the other studied carbide systems stepwise sintering occurred and as a result of this the character of the kinetic relations differed considerably from that indicated by the theoretically derived curves, which are based on homogeneous or fully nonreacting systems. Real systems are neither fully homogeneous nor nonreacting. The following Card 3/5 conclusions are arrived at: The present theory of

69>70 2/034/60/000/04/006/028 E073/E535

The Kinetics of Sintering of Cermets Under Conditions of Liquid Phase Formation

sintering has been evolved for crystalline and amorphous substances and does not reflect the real phenomena taking place during sintering of two-phase and multi-phase metal systems under conditions under which a liquid phase exists. The kinetics of sintering of these materials, studied on the basis of direct measurement of the shrinkage of presslings in vacuum, differs considerably from the relations derived for the model material. The progress of sintering is governed not only by the viscosity and the surface tension of the liquid phase, but mainly by the adhesion constant, which can be influenced for instance by changes in the used atmosphere. These factors complicate the behaviour of a real system during sintering under conditions of occurrence of the liquid phase to such an extent that it is not possible to apply to them simple physical conceptions. The measured results indicate that the kinetics of sintering are highly individual for various systems particularly as regards gradual shrinkage: these phenomena must be studied in conjunction with the

Card 4/5

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E073/E535 The Kinetics of Sintering of Cermets Under Conditions of Liquid Phase Formation

> phase changes of the system. There are 9 figures, 1 table and 10 references, 1 of which is Czech, 3 Soviet and 6 English.

ASSOCIATION: VÚPM, Vestec mr Prague

SUBMITTED: June 27, 1959

Card 5/5

Z/034/60/000/012/012/015 E073/E535

AUTHOR: Čech, B., Engineer

TITLE: Method of Producing Multi-hole Nozzles for Spraying

Metal Fibres

(Patent Class 7b, 10/10, PV 1374-60, 1.3.1960)

PERIODICAL: Hutnické listy, 1960, No.12, p.983

TEXT: The aim of the invention is to produce a nozzle which can withstand the effect of molten metal against the thermal changes and against oxidation, which will ensure continuous quality of the fibres and will enable long duration operation. The body of the nozzle is made from a powder or a plastified mixture of refractory carbides, borides, nitrides, silicides, oxides and up to 50% by volume of the metal with a fusion temperature of 1200°C. Prior to compacting, a system of wires is inserted which are pulled out after compacting. Following that, the nozzles are sintered by heat treatment.

Card 1/1

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AUTHORS:

Cech, B., Engineer and Zeman, K. Engineer

TITLE:

Method of Producing Carbide Heat Resistant and Abrasion

Resistant Chromium Carbide Base Material (Patent Class 40b, 17, PV 1457-60 4.3.1960)

PERIODICAL: Hutnické listy, 1960, No.12, p.984

In the material the growth of crystalline grains at TEXT: elevated temperatures is stabilized. The mixture of chromium and $Cr_7^{}$ in the ratio 99:1 up to 50:50 carbides (90:10 is best) and nickel or nickel alloys in quantities between 2 and 40% (preferably 10 to 15%) is stabilized by adding individually or in combination the following carbides: WC, TiC, Mo2C, TaC, NbC, VC in quantities of 1 to 10% (preferably 3 to 5% of the weight of the mixture) so that the grain growth increases by not more than double at temperatures up to 1300°C with insignificant changes in the mechanical properties. Prior to pressing, the initial mixture is treated with an addition of an organic substance which decomposes at 500°C leaving behind finely distributed carbon. On heating to a higher temperature, this carbon becomes dissolved and combines with with the metals present in such a way that the content of free carbon Card 1/1 will not exceed 0.1%.

T0280

\$/137/62/000/008/017/065 A006/A101

18.1200

AUTHORS:

Čech, Bohuslav, Zeman, Karel

TITLE:

A method of preparing heat and wear resistant materials on

chromium-carbide base

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 52, abstract &G364 P

(Czech. patent no. 99283, April 15, 1961)

It is proposed to alloy a mixture of Cr carbides (Cr₃C₂ and Cr₇C₃ in TEXT: a 99 : 1 up to 50 : 50 ratio, optimum ratio - 90 : 10) and a Ni-binder admixture (2 - 40%, usually 10 - 15%) with W, Ti, Mo, Ta, Nb, V carbides (in a 1 - 10%, or preferably 3 - 5% quantity). These admixtures reduce grain growth during sintering and raise strength characteristics. Prior to pressing an organic binder is introduced to the charge; sintering is performed at 1,300 - 1,340°C.

R. Andriyevskiy

[Abstracter's note: Complete translation]

Card 1/1

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1439, 1411, 1142 15.2210

Z/034/61/000/001/020/021 E073/E535

Card 1/2

Čech, B., Engineer

AUTHOR: TTTLE:

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Materials and Technology of Manufacture of Protective

Tubes of Submersion Pyrometers

PERIODICAL: Hutnicke listy, 1961, No.1, p.67

TEXT: A technology was evolved for manufacturing materials for protective tubing of pyrometers which have to be submerged during measurements into the molten metal. This material will substitute quartz tubes which were applicable only up to 1600°C substitute quartz tubes. for short durations and for one time only. It was found that the most suitable materials for withstanding the thermal shocks, erosion by the liquid metal, with a sufficient refractoriness and heat conductivity are ZrB2-Ni (Borolit) and Al203-Mo (Heratherm). Only Al203-Mo has practical applications. The drawback of ZrB2-Ni is the scarcity and high cost of raw materials for producing it. Submersion pyrometers with a protective tube made of cermets are suitable for measuring the temperatures in blast furnaces, convertors, cupolas, steel furnaces and in the ladle under a layer of slag, in induction furnaces of all sizes, as well as for

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Materials and Technology of Manufacture of Protective Tubes of Submersion Pyrometers

measuring the temperature of the metal stream during tapping and casting. The material was developed by the Powder Metallurgy Research Institute, Vestec, Nr. Prague. (Task No. 59-006-R/V).

ASSOCIATION: Výzkumný ústav pro práškovou metalurgii, Vestec u Prahy (Powder Metallurgy Research Institute, Vestec, Nr. Prague)

Card 2/2

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\$/123/62/000/022/002/003 A004/A101

1.1600

Čech, Bohuslav, Zeman, Karel

TITLE:

AUTHORS:

Manufacturing parts of heat-resistant alloys by powder metallurgy

methods

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 22, 1962, 30, abstract 22B153P (Czechoslovakian Patent, Class 40 b, 2, No. 99738, May 15,

1961)

A method is patented which consists in that the part is formed from TEXT: powdered heat-resistant materials (e.g., carbides, nitrides, borides, silicides, oxides) or their mixtures, and is then impregnated for binding with relatively low-melting metals, e.g., cobalt, nickel. An example is presented in manufacturing the blades of a steam turbine. The turbine blade model 1 (see Fig.) was made of TiC powder of 2 µ grain size and a 12% (by weight) mixture of beeswax, paraffin and synthetic wax; a cylinder of the binding alloy 2 is placed on the model. Mixture 3 consisting of 80% Al₂0₃ of 1 mm grain size and 20% Al₂0₃ of 2μ grain size was filled in around the blade. Heating starts after a 0.1 mm

Card 1/3

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Manufacturing parts of heat-resistant alloys by A004/A101

Hg vacuum is produced. The first heating stage at 200°C lasts 3 h and is intended for burning out the paraffin-wax binder. During the second stage, the temperature is raised to 1,400°C and held for 30 min. During this period the binding alloy 2 is melted and diffuses into the pores of the turbine blade. This is followed by rapid cooling. Heating can be effected also by the induction method.

S. Palestin

[Abstracter's note: Complete translation]

Card 2/3

s/276/63/000/004/002/007 A052/A126

AUTHOR: Cech, Bohuslav

TITLE:

Method of manufacturing multihole drawing dies for metal thread

extrusion

PERIODICAL: Referativnyy zhurnal, Tekhnologiya mashinostroyeniya, no. 4,

1963, 56, abstract 4B261 P. (Czech. pat., no. 99270, April 15,

1961)

TEXT: The patented method of manufacturing multihole drawing dies for extruding threads of molten non-ferrous metals and alloys consists in the following: a powder or plasticized mixture (grain size less than 2 microns) of heat-resisting carbides, borides, nitrides, cilicides or oxides with an addition of a binding metal (Ni or Cr) with a melting point of over 1,200°C is pressed in a die in the cavity of which a system of wire rods (of a high-strength metal with a smooth surface) is arranged; the rods are precoated with a thin layer of a lubricant (e.g. paraffin). After the mixture has solidified the rods are removed from the die. In sintering the diameter of the holes formed by the rods decreases by 25%. Such drawing dies are resistant to erosion (caused by molten extruded metals), crack

Method of manufacturing multihole ...

S/282/63/000/004/002/007 A052/A126

formation (caused by temperature changes) and to oxidation in air. An example of the chemical composition of a mixture is given for a drawing die 30 mm in diameter with 100 holes for extruding Al- and Cu-alloy threads.

I. Golovney

[Abstracter's note: Complete translation.]

Card 2/2

CECH, Bohuslav; BROUKAL, Josef

Kinetics of molybdenum disilicide sintering with admixture of kaolin and quartz. Silikaty 7 no.3:193-205 '63.

- 1. Vyzkumny ustav pro praskovou metalurgii (for Cech).
- 2. Statni vyzkumny ustav sklarsky (for Broukal).

CECH, B., inz., C.Sc.

"Metalloceramic hard alloys" by V.N.Tretjakov [Tretyakov, V.I.]. Reviewed by B.Cech. Hut listy 18 no.1:75-76 Ja '63.

CECH, Bohuslav, inz., GSo.

On the theory of solid phase sintering of metals and alloys. Hut listy 18 no.10:722-726 0 '63.

1. Vyzkumny ustav pro praskovou metalurgii.

CECH, Bohuslav, inz., CSc.

Theory of alloy sintering during the formation and presence of the liquid phase. But listy 18 no.11: 783-785 N*63.

1. Vyzkumny ustav pro praskovou metalurgii, Vestec u Prahy.

CECH, Bohuslay, inz., CSc.

High- temperature technology in the light of new publications in particular, collections of papers. But listy 18 no.11: 830-831 Nº63.

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ACCESSION NR: AP4017928

2/0065/64/000/001/0043/0057

AUTHOR: Cech, Bohuslav (Chekh, Boguslav); Hampl, Vladimir (Gampl, Vladimir)

TITE: Contribution to the study of structural stability conditions in heterogeneous alloys

SOURCE: Kovove materialy, no. 1, 1964, 43-57

TOPIC TAGS: structural stability, heterogeneous alloy, metallographic method, dispersed system, liquid phase, grain boundary, surface energy, dihedral angle, surface stress, groove angle

ABSTRACT: The paper discusses a dispersed system in the presence of the liquid phase, the external form of certain particles and the properties of the system, changes in dispersion with the growth of certain particles and the stability of grain boundaries depending upon the mutual orientation of the grains. It describes the metallographic methods for determining the energy of grain boundaries and inter-phase surface, deduces the stability of the heterogeneous structure therefrom and determines the surface-energy values from the structure of the two alloys by the method proposed. By studying the dihedral angles in the structure of the

Card 1/2

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ACCESSION NR: AP4017928

Cr₃C₂ system after prolonged annealing, the maximum stability of the Cr₃C₂ grain boundaries was determined at a dihedral angle 85--90°. The ratio between the energy of this boundary and the inter-phase energy in the presence of a liquid phase corresponds to the formula for surface stress sigma_{SS} $\stackrel{?}{=}$ 1.41 sigma_{SL}. By measuring the groove angles at the phase boundaries after vacuum annealing, the authors found the inter-phase energy at 1,100C in the TiC--Ni/Al system to be about 1,180 erg/cm². Original has 6 graphs, 6 diagrams, and 6 numbered equations.

ASSOCIATION: Vyzkumny ustav pro praskovou metalurgii, Vestec near Prague (Research Establishment for Powder Metallurgy)

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Card 2/2

L 13248-65 EWP(e)/EWP(t)/EWP(k)/EWP(b) Pf-4 JD Z/0000/64/000/00099/0051

AUMCR: Cach, B. (Chekh, B.) (Engineer, Candidate of sciences)

B

TIPLE: The kinetics of growth of dispersed solid particles in presence of liquid phase

SOURCE: Medzinarodna konferencia o praskovej metalurgii. lat. 1962. Iroblemy praskovej metalurgie; sbornik vedeckých praio (Problems in powier metalurgi; //c collection of scientific papers). Bratialuva, Vyd-vo SAV, 1964, 39-5.

TOPIC TAGS: nonplastic particle, coalescence, constant temperature, particle orientation

ABSTRACT: The investigation of the kinetics of growth of dispersed naplastic particles in presence of the liquid phase has shown that the particles ecalesce at comstant temperature. The nechanism of the conlescence is connected with the orientation of the particles against each other. The presence of liquid phase facilitates the orientation changes and the subsequent particle coalescence. This investigation was carried out on Fe-Cu, WC-Co, TiC-Ni, Cr₂C₂-N and other compounds.

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	L 13248-65 ACCESSION RR: AT4046755 ASSOCIATION: Vyzkumny ustav pro praskovou metalungii, Vestec (Research Institute of Powder Metallungy)					
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L 22815-66 EWP(e)/EPF(n)-2/EWP(t)/EWP(k)JD/WW/IG/WH SOURCE CODE: CZ/0034/65/000/004/0268/0275 ACC NRI AP6010703 Cech, Bohuslav (Engineer; Candidate of sciences) AUTHOR: ORG: Research Institute for Powder Metallurgy, Sumperk (Vyzkumny ustav pro praskovou metalurgii) TITIE: Development of special ceramic and metal-ceramic materials for needs of the metallurgical industry SOURCE: Hutnicke listy, no. 4, 1965, 268-275 TOPIC TAGS: metal ceramic material, graphite, ceramic material, molten metal, metallurgy ABSTRACT: The present materials available in Czechoslovakia are discussed; their possible application in the preparation of parts required in the metallurgical industry is discussed. Properties required for parts in contact with molten metals are described. Plasma spraying of coatings of metals and graphite appears to be the most promising method of using high temperature materials. Orig. art. has: 7 figures and 4 tables. [JPRS] SUB CODE: 11 / SUBM DATE: none / OTH REF: 002 / SOV REF: 001

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<u>Card</u> 1/1

UDC: 666.76:669: 669.018.25

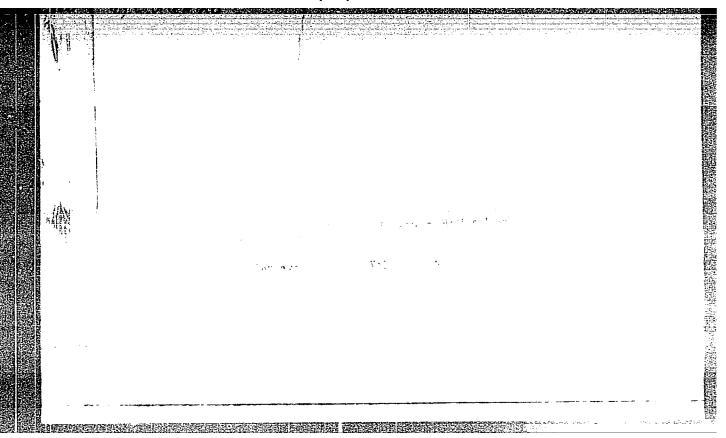
CECH, Bohuslav

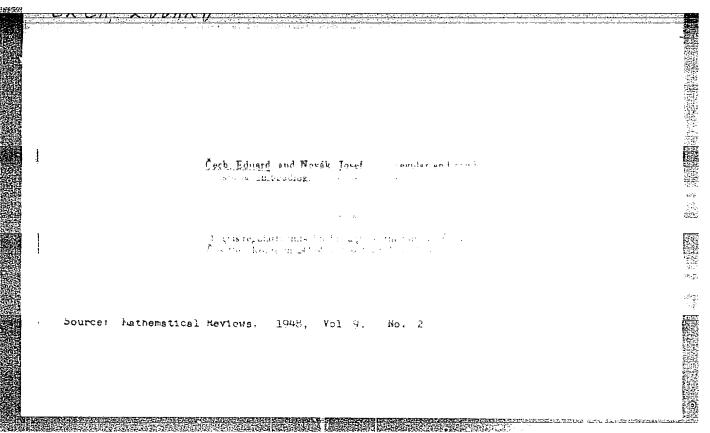
CHEKH, Boguslav [Cech, Bohuslav] (Chekhoslovatskaya Sotsialisticheskaya Respublika)

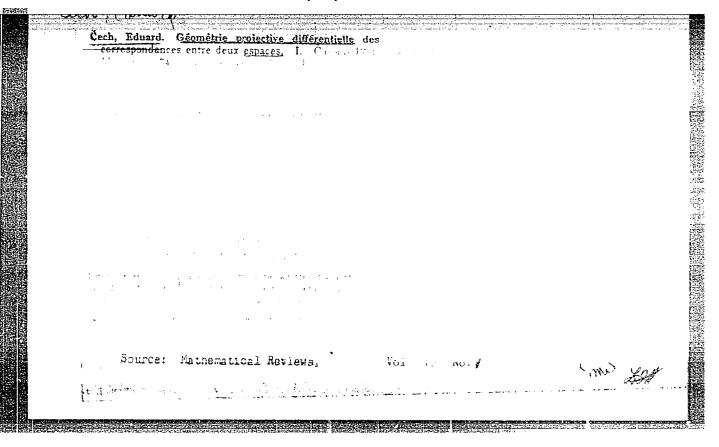
Viscous flow in the sintering process in presence of a liquid phase.

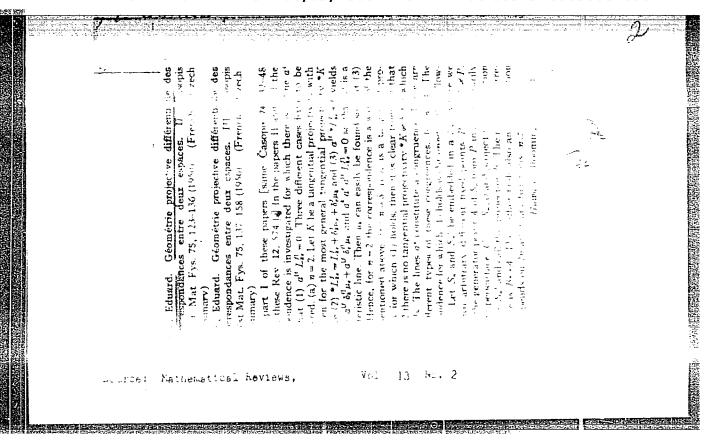
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(Sintering) (Viscosity)







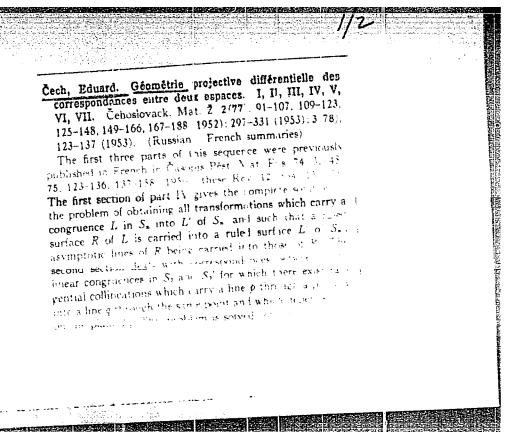


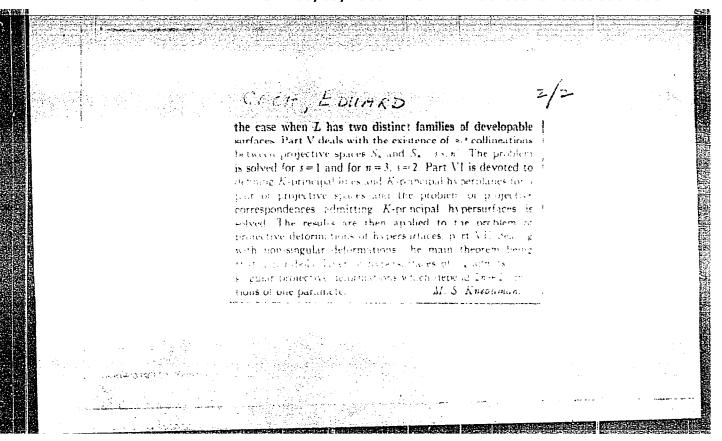
CECH, Eduard. (Praha).

Projective differential geometry of correspondences between two spaces. Part 1-5. Chekh.mat.zhur. 2 no.2:91-188 J1 '52.

(Geometry, Differential--Projective) (Spaces, Generalized)

Opening of the Slovak Acadamy of Sciences. p. 11 (Natematicko-Fyzikalny Casopis. Bratislave. Vol. 3. no. 1/2, 1953)
S0: Monthly List of Surepean Acression (SMAL), 10, Vol. 4, No. 6,
June 1955, Uncl.





CECH, Eduard (Praga)

Projective differential geometry of correspondences between two spaces.

Projective differential geometry of correspondences between two spaces.

(MLRA 7:5)

(Geometry, Differential--Projective) (Spaces, Generalized)

Projective differential geometry of correspondences between two spaces. Part 7 [with summary in French]. Chekh.mat.zhur. 3 no.2: 123-137 Je 153.

CECH, EDUARD

Cisla a pocetni vykony. (Vyd. 1.) Praha, Statni nakl. technicke literatury, 1954. 246 p. (Numbers and calculation process. 1st ed. diagrs.)

SOURCE: East European Accessions List (SPAL) Library of Congress. Vol. 5, No. 1, January, 1956.

CECH, Eduard (Praga)

Projective differential geometry of correspondences between two spaces.

Part 8. [in Russian with summary in French]. Chekh.mat.zhur. 4 no.2:
143-174 My '54. (MLRA 7:6)
(Geometry, Differential--Projective) (Spaces, Generalized)